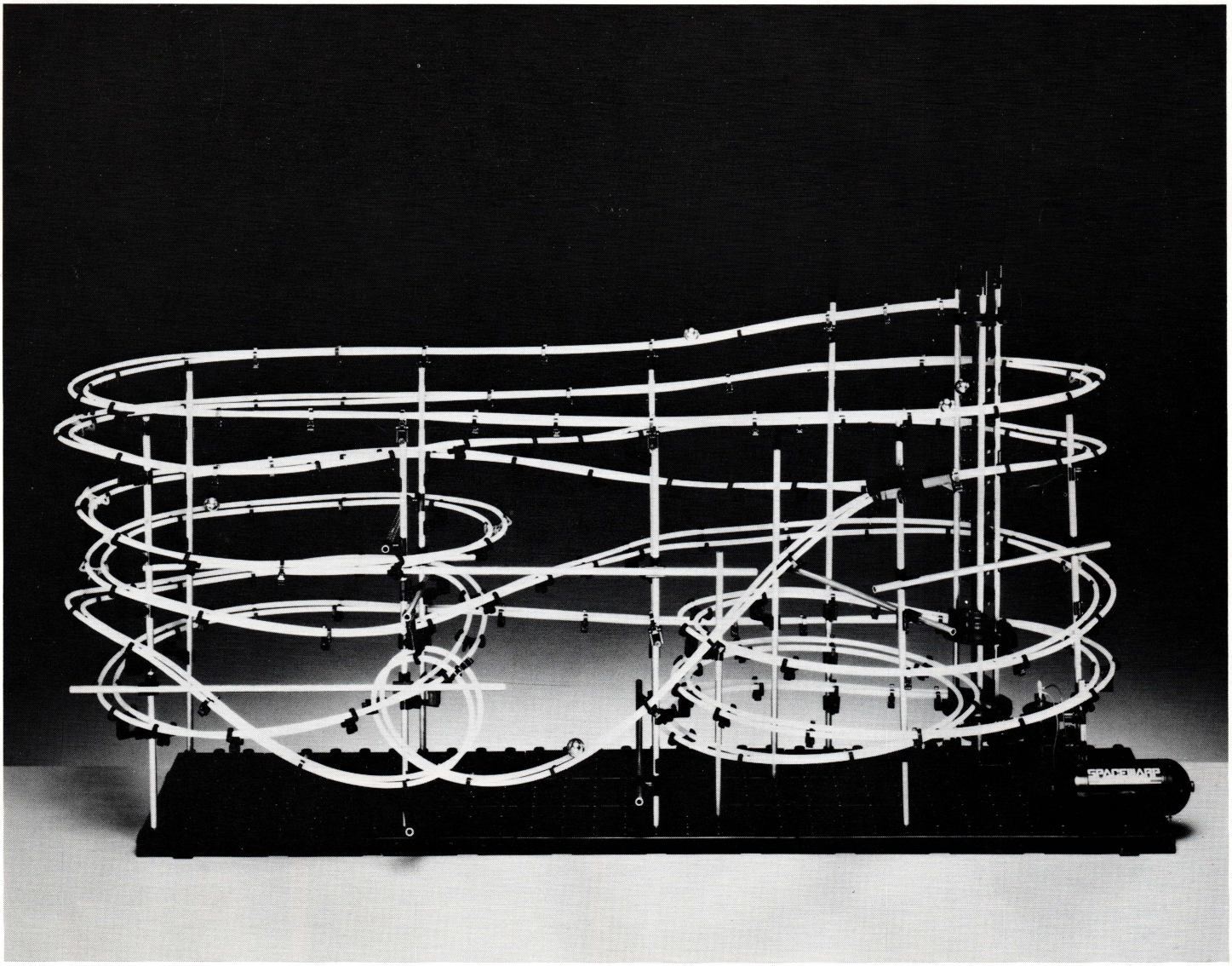
INSTRUCTION BOOKLET

SPACEWARP™

Fun to play!
A Challenge to build!
Construct your own crazy roller coaster.

SET 20
Intermediate Coaster



For children under 12 years old, parental assistance in assembly of item may be required.

BANDAI

This double set has the addition of double rails, which enables you to enjoy more exciting course layouts.

SPACEWARP is a new hobby of design in space, by creating a network of rails based on calculations of how a ball moves through them.

PRIOR TO ASSEMBLY

- Read the instructions carefully before assembling.
- The parts are shown on the back cover. Check that all the parts are included before assembling.
- Trim any extra plastic off components.
- The tools you might need for assembly are pliers, a Phillips screwdriver, needle nose pliers and mat knife.
- Cut out the parts list on the back cover and refer to it when assembling.

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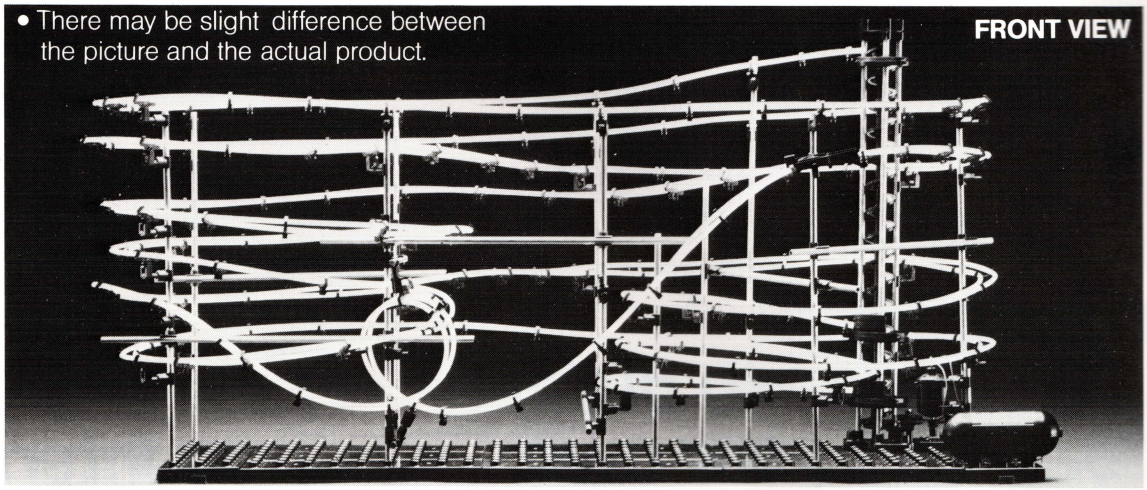
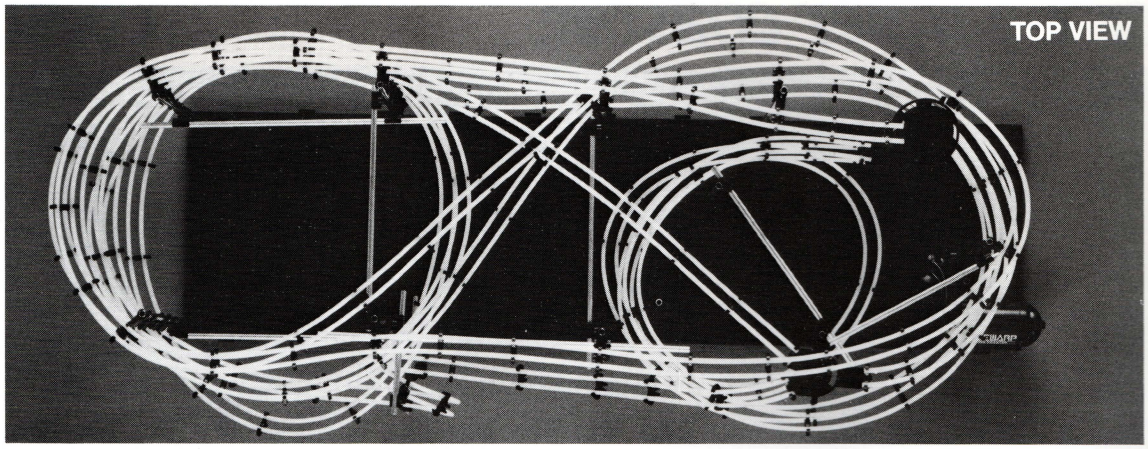
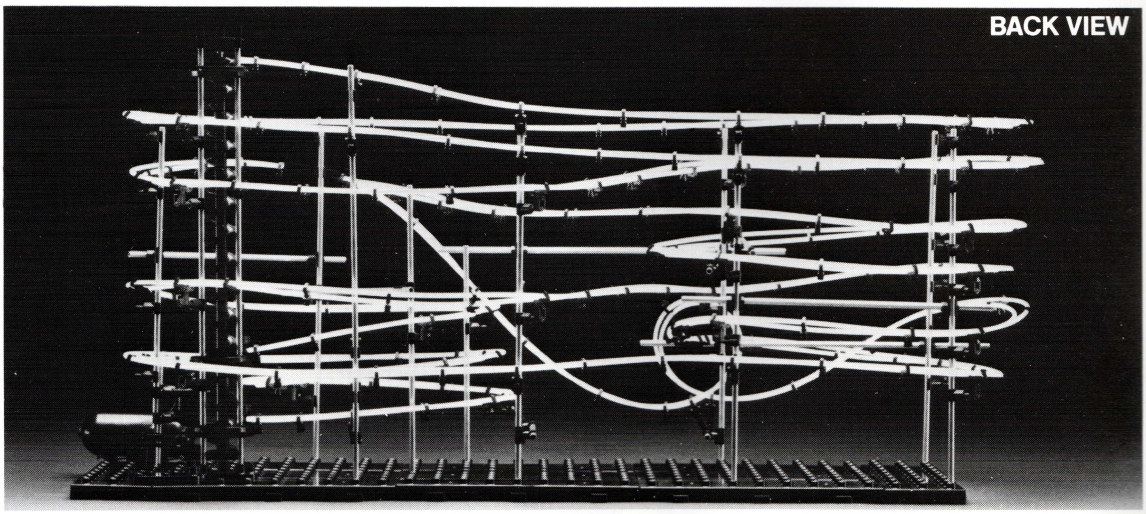
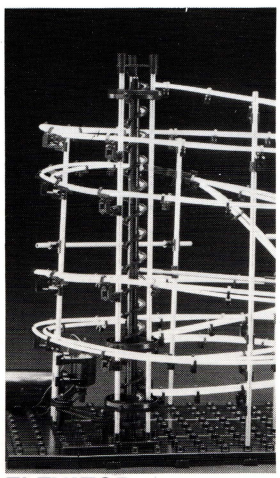
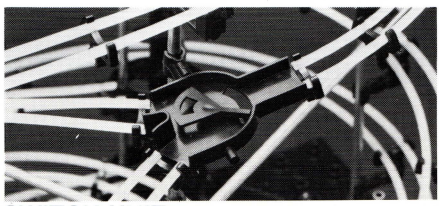
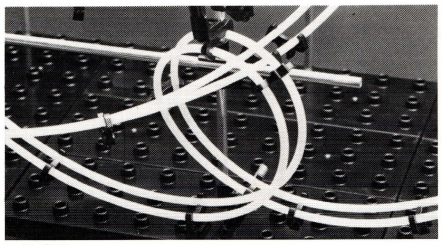


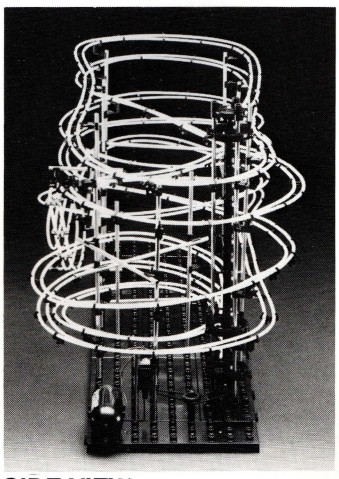


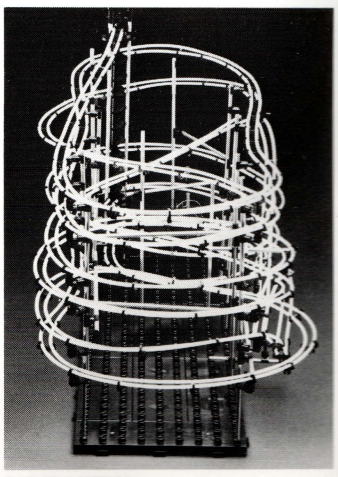



ELEVATOR


SWITCH UNIT


LOOP

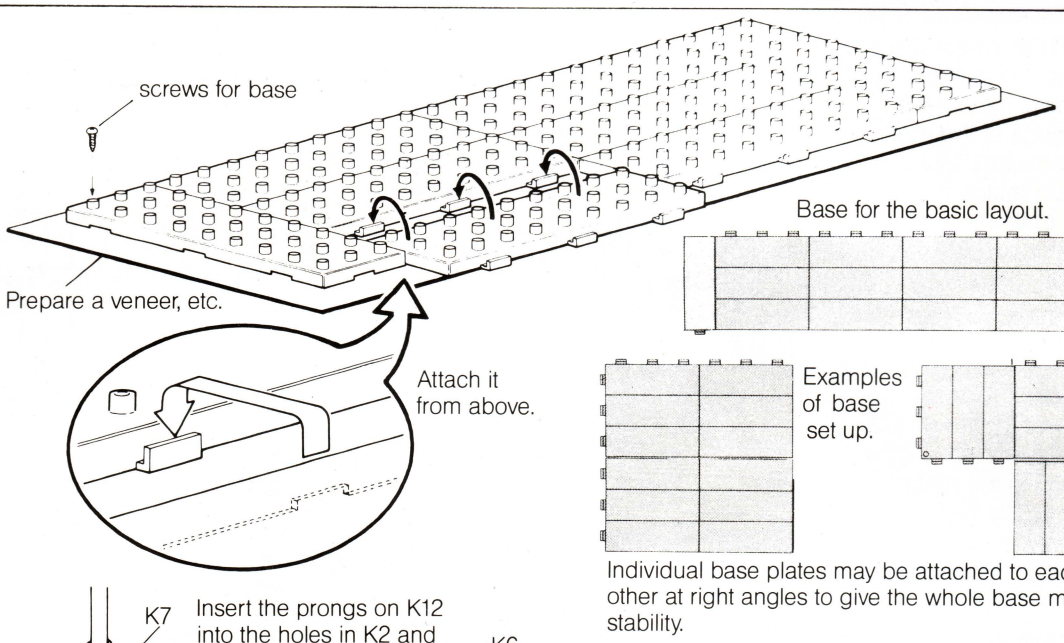

SIDE VIEW


SIDE VIEW

HOW TO ASSEMBLE SPACEWARP

1. BASE ASSEMBLY

First, think of a basic layout, depending upon what kind of course you would like to create. (An example is shown.) Next, connect the base units using the connecting hooks. Make sure they are aligned properly; they will not connect if put together in the wrong direction. When you expand the size of the base and you find it necessary to increase the strength or you want to display the completed set, use the screws that are included in the set to fix the base to a board, etc. See page 8 for the basic layout



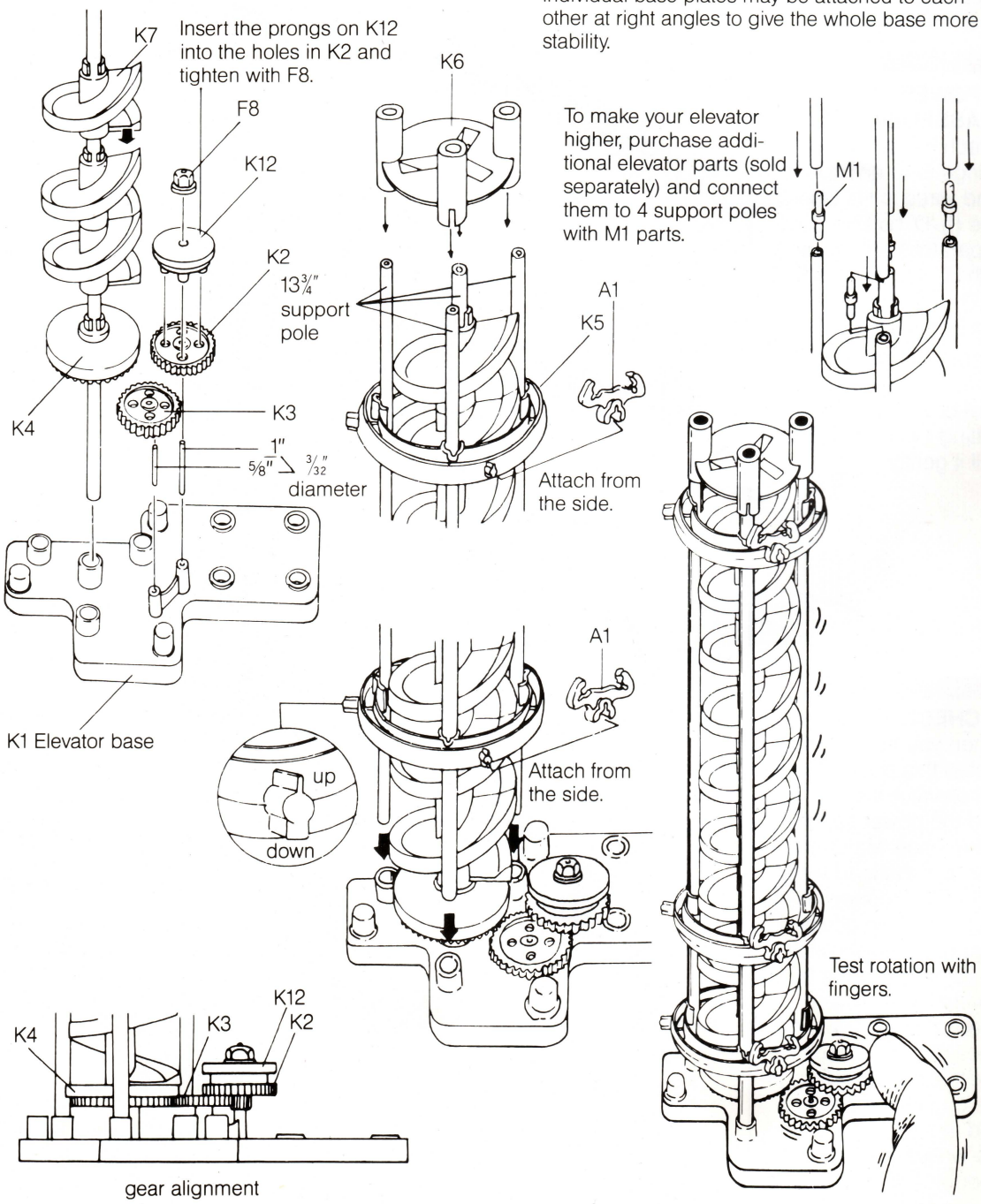
Individual base plates may be attached to each other at right angles to give the whole base more stability.

2. ELEVATOR ASSEMBLY

Insert 5/8" and 1" gear shafts in the indicated positions, making sure each gear is complete. Insert a 13 3/4" long support pole. Slide a K4 on the pole and add K7s one on top of another. Be careful that K4 is right side up. The gears should match as shown in the picture. When you have finished stacking the K7s, insert 3 more support poles (13 3/4") to the indicated positions, fixing their positions with K5. Make sure you have K5 right side up. Put K6 on top, and the elevator is complete.

K5 will be the entrance or exit for your ball. Make sure it aligns with the rails by jiggling it up and down a little, if necessary. Fix A1 to the entrance.

When you are finished, test to see that the gears turn smoothly by moving them with your fingers. If you hear a strange sound or if it's too tight to rotate, first check to see that the elevator is not warped, then adjust the connection of the gears.



3. MOTOR ASSEMBLY

Connect G3 to the motor as shown, and bend the prongs of the motor slightly inward. Make sure you match the shape of the tip on the back of the motor with the hole of G3. If not matched properly, they will not work well. Place the motor with wires and connectors attached on G1. Cover them with G2. The lead wire should be fastened to the metal fittings tightly. Hook the motor bed to the two support poles and connect the motor to it.

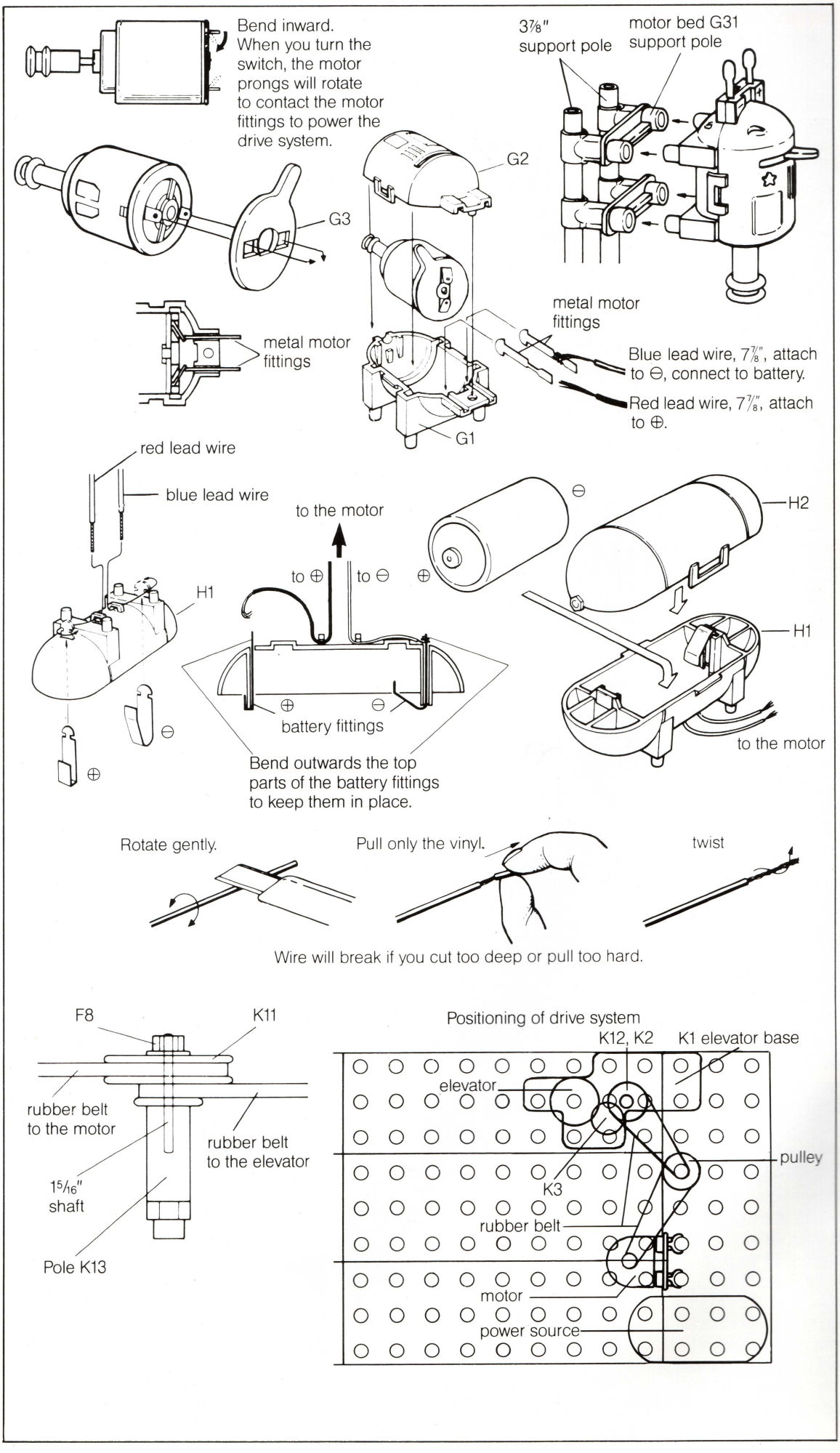
4. POWER UNIT ASSEMBLY

Attach metal battery fittings ⊕ ⊖ and the lead wires to H1. Insert one (1) 'D' battery (sold separately) and cover it with H2. Avoid mixing up ⊕ ⊖.

PLEASE NOTE: To expose the electric wire in the lead line, trim the vinyl cover by carefully cutting it with a knife, and pull it gently.

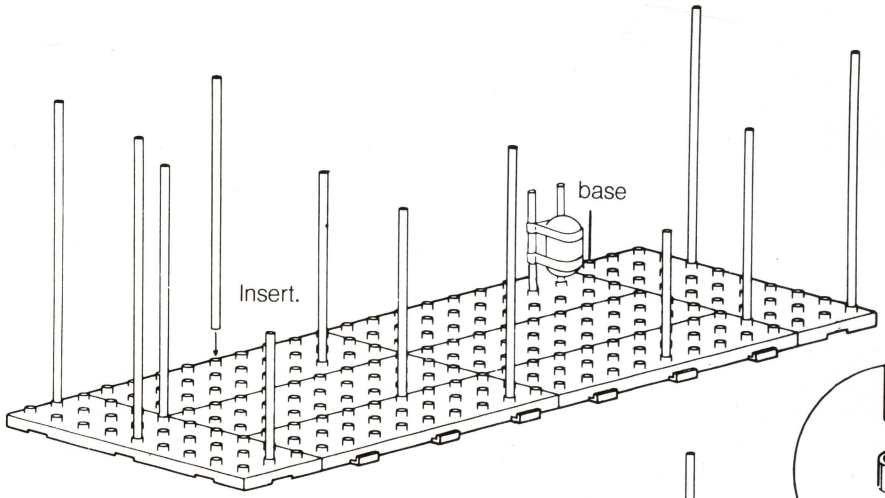
5. CHECK POINT 1

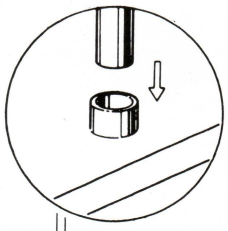
When you have completed this stage, attach the elevator, the motor and the power supply to the base. Match the colors of the lead wires when you connect the motor with the power supply. Turn the switch on (by pushing the lever toward the star), and check that it moves. If it doesn't move, check to see that the metal fittings are connected properly and that the lead wires are wrapped around enough.

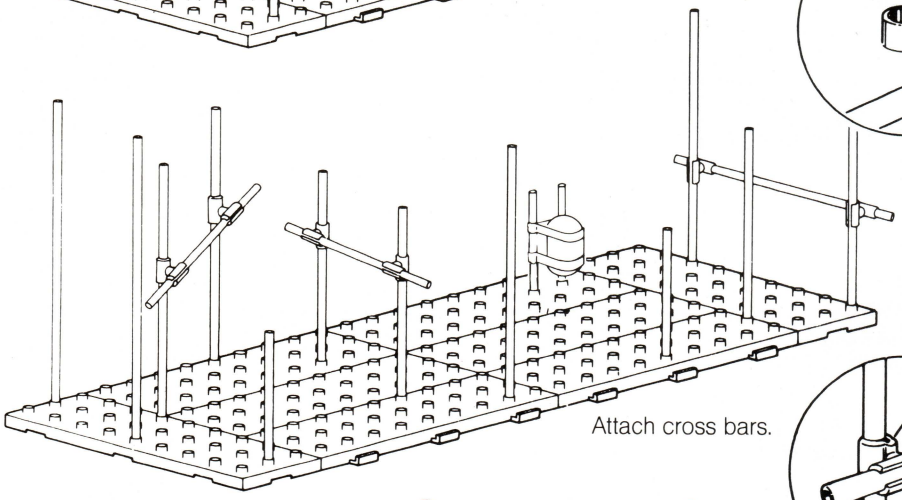


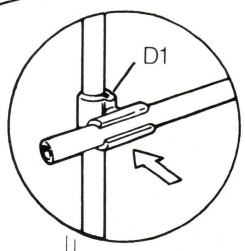
6. HOW TO ASSEMBLE SUPPORT POLES

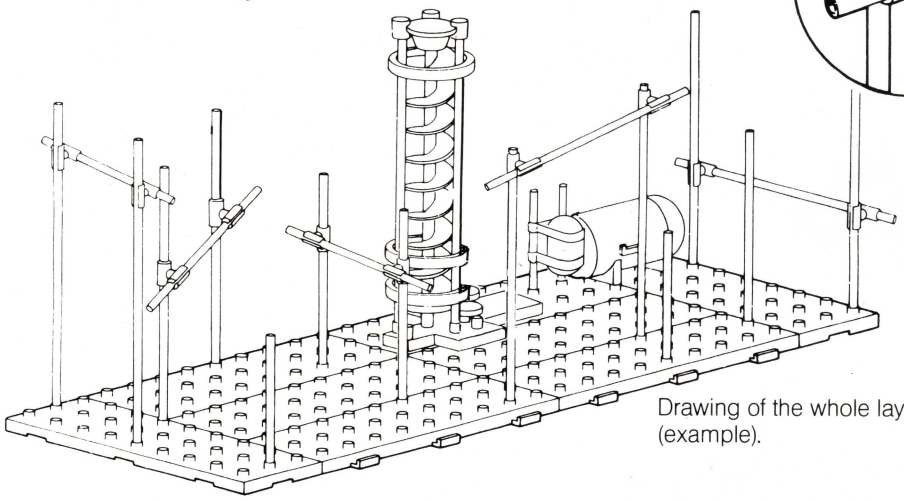
Insert the support poles into the base holes. (The drawing is an example. For the basic layout, refer to the ground plan on P8 and the picture of the completed set on P2.) Once the vertical poles have been inserted, attach cross bars where needed to strengthen the vertical poles, or where necessary for your layout. As shown here, insert the cross bars horizontally in D1.







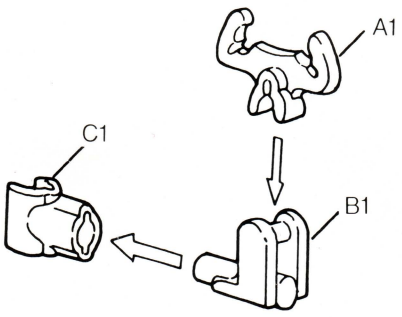




Drawing of the whole layout (example).

7. HOW TO ASSEMBLE RAIL ARMS

Assemble the arms that support the rails as shown.



8. HOW TO ATTACH RAILS

Attach rails from below. There is a choice between two courses in the basic layout.

- Attach rail arms on each part, referring to the completed picture of the basic layout.

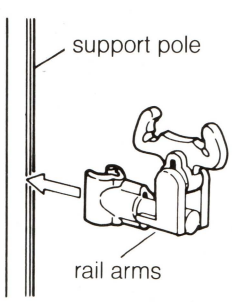
To connect rails, use rail joints (3/8" shafts). Insert them into the holes in the center of the rails. Trim the end of rails neatly so the joint is smooth.

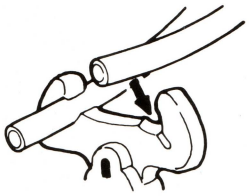
When the parts are all assembled, test with a ball and adjust accordingly.

How to assemble switches.

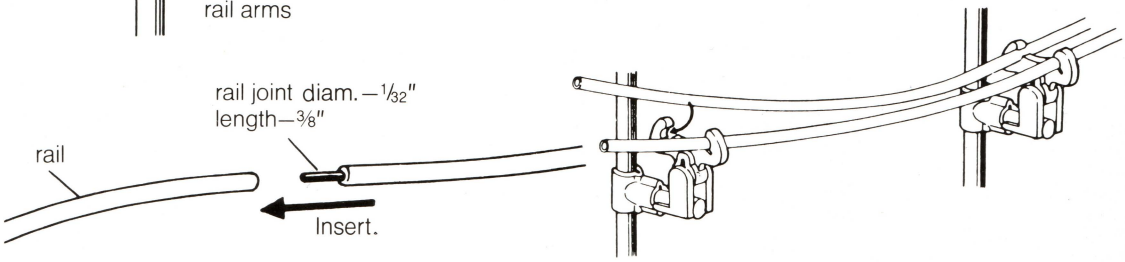
Insert P2, making sure the claw fits into the slot. Be careful not to break the claw. Attach part A1 to the entrances and exits as shown. Then, use C1 to attach the switch to the support pole.

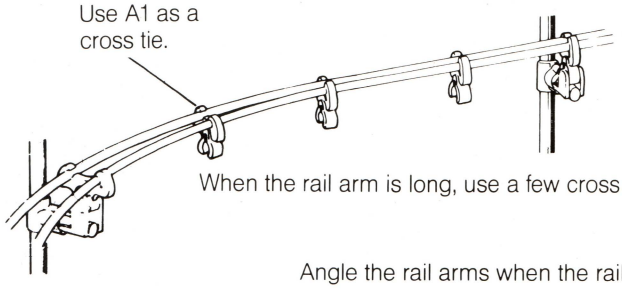
If the ball derails, bank the curve. If derailing still occurs, the speed of the ball is too high. Slow the ball down before it enters a curve as shown in the drawing.



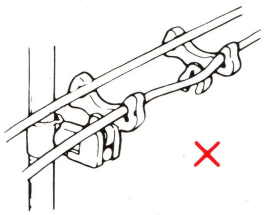


Attach rails to A1.



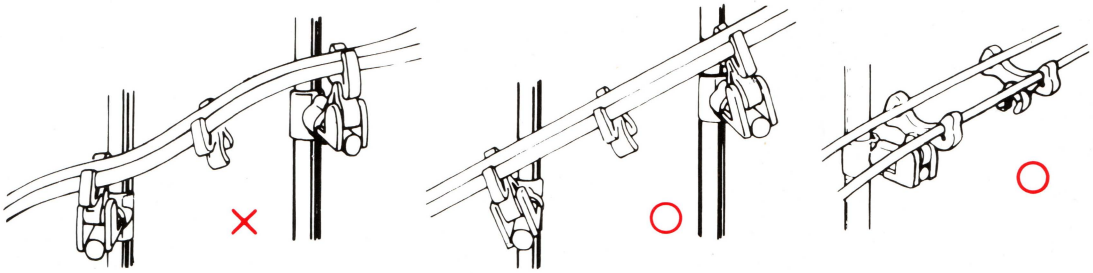


When the rail arm is long, use a few cross ties.

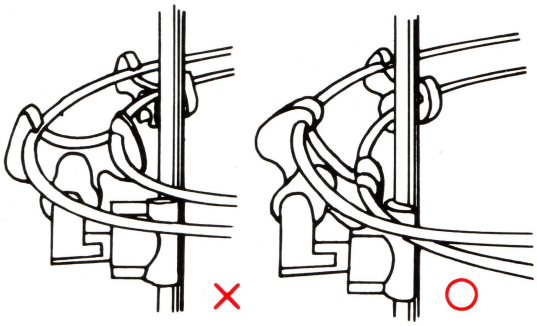


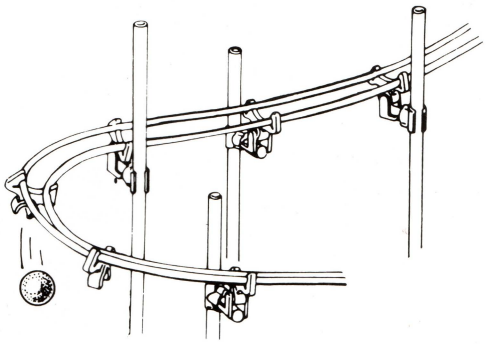
Make sure the rails are parallel.

Angle the rail arms when the rail is sloping.



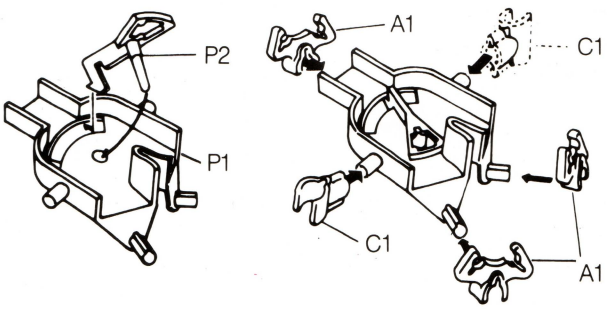
Make sure the curves are banked.

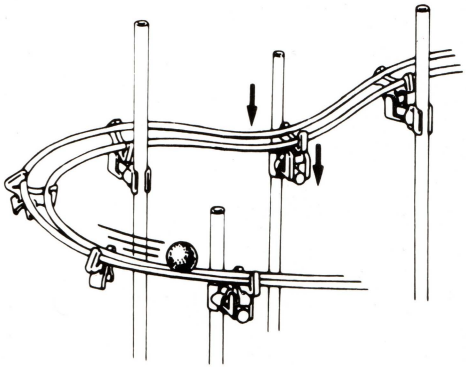




Lower the speed before a curve.

How to assemble switches.



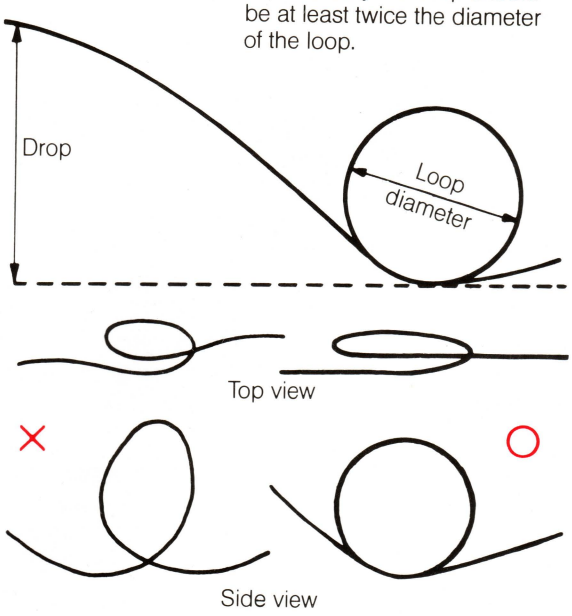


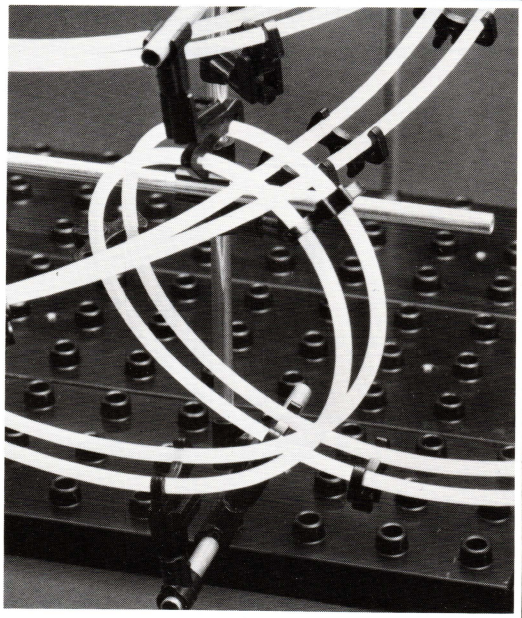
X = INCORRECT WAY
O = CORRECT WAY

9. HOW TO MAKE A DOUBLE LOOP

To make a loop work well takes careful adjustments. Experiment running a ball to make sure it has enough speed to go around the loop.

Make sure each part is set properly. For example, check to see that rail arms, cross ties (A1), support poles and rails are set properly. Check that rails are not off the cross ties, and check to see that rail arms are not off the support poles.



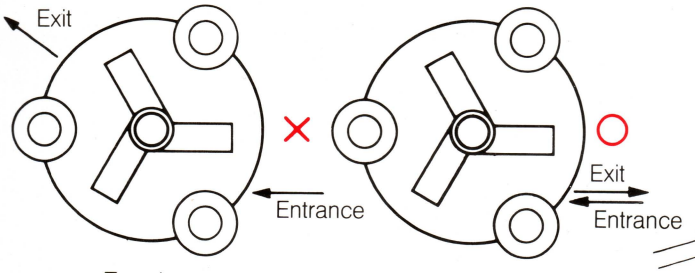


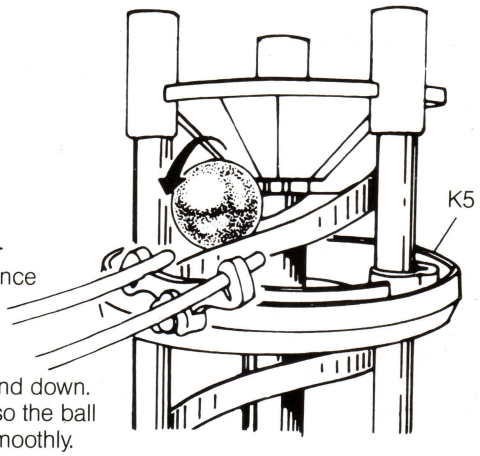
10. ELEVATOR ENTRANCES AND EXITS

Elevator entrances and exits should be both on the same side. This reassures continuous driving.

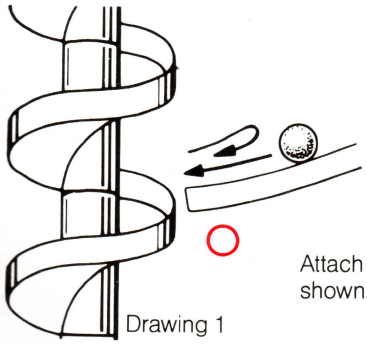
The elevator entrance should be located on an upper level, allowing the ball to roll easily down a long path as shown in Drawing 1.

If the ball is moving too fast, it may bounce or fall off. Drawing 2 shows a case where the ball bounces back, loses its speed, and stops on the rail.



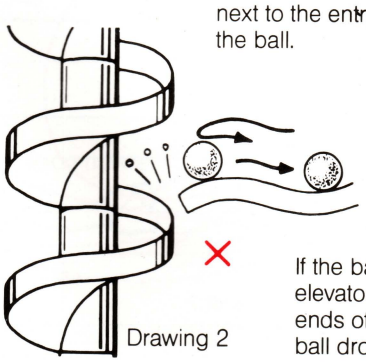


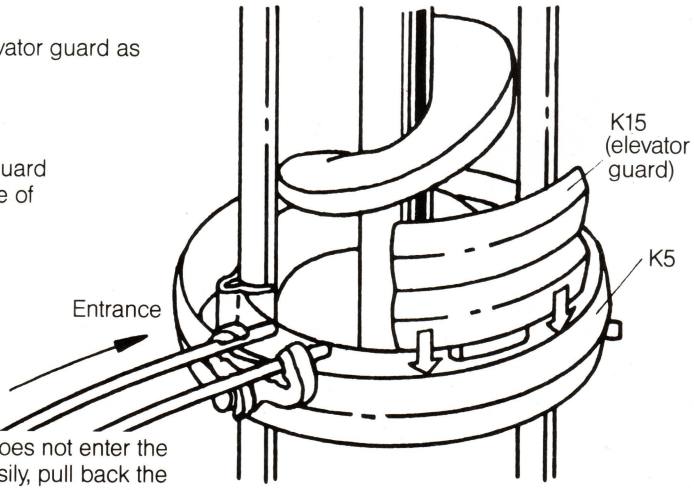
Adjust K5 up and down. Adjust the rail so the ball will ride on it smoothly.



Attach elevator guard as shown.

Insert an elevator guard next to the entrance of the ball.





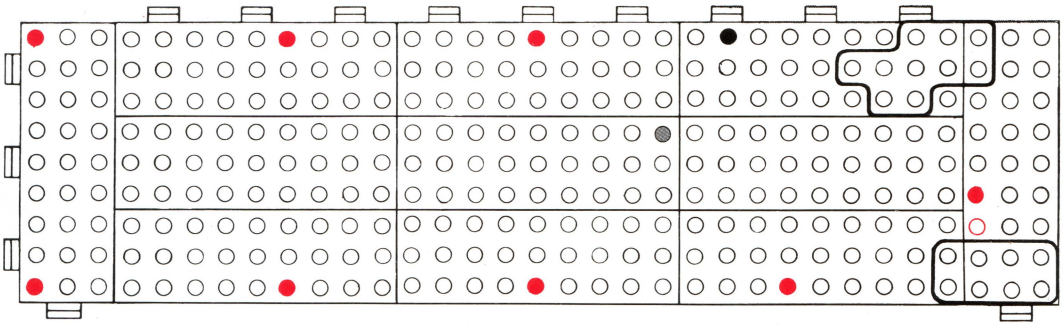
If the ball does not enter the elevator easily, pull back the ends of the rails to let the ball drop into the elevator entrance.

X = INCORRECT WAY
O = CORRECT WAY

MASTER THE BASIC LAYOUT FIRST BEFORE YOU CREATE YOUR OWN ORIGINAL COURSES.

SPACEWARP allows you to create your own course layout. But it will help to first master the basics of course creation with the basic layout here. Then you can expand your enjoyment of SPACEWARP with partial changes of the basic layout to totally creating your own layouts.

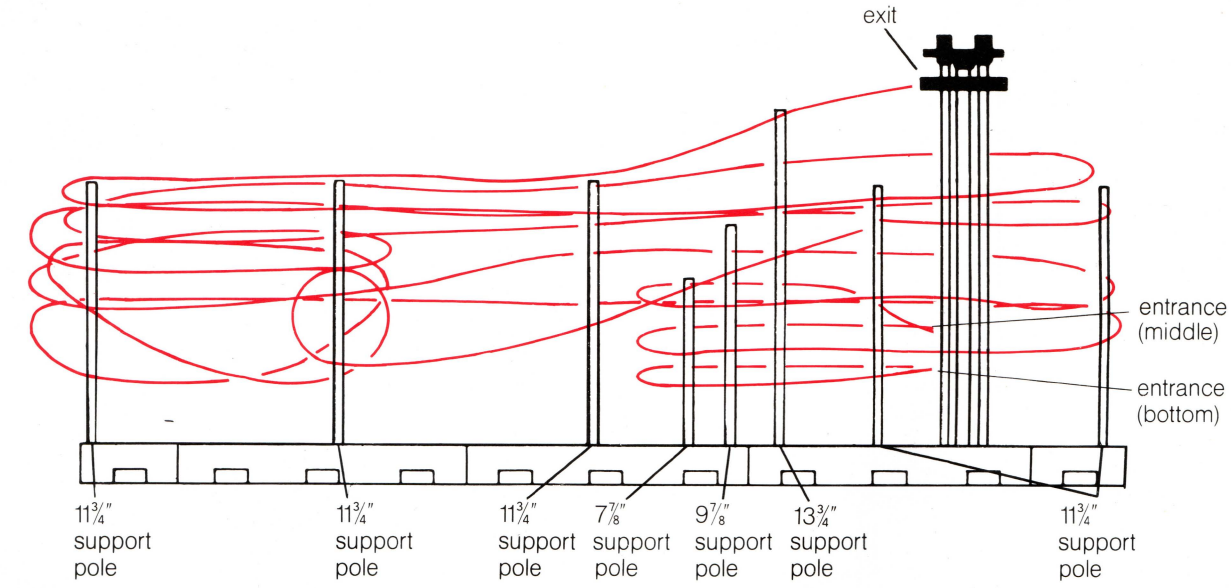
POSITIONS OF SUPPORT POLE AND POWER UNIT

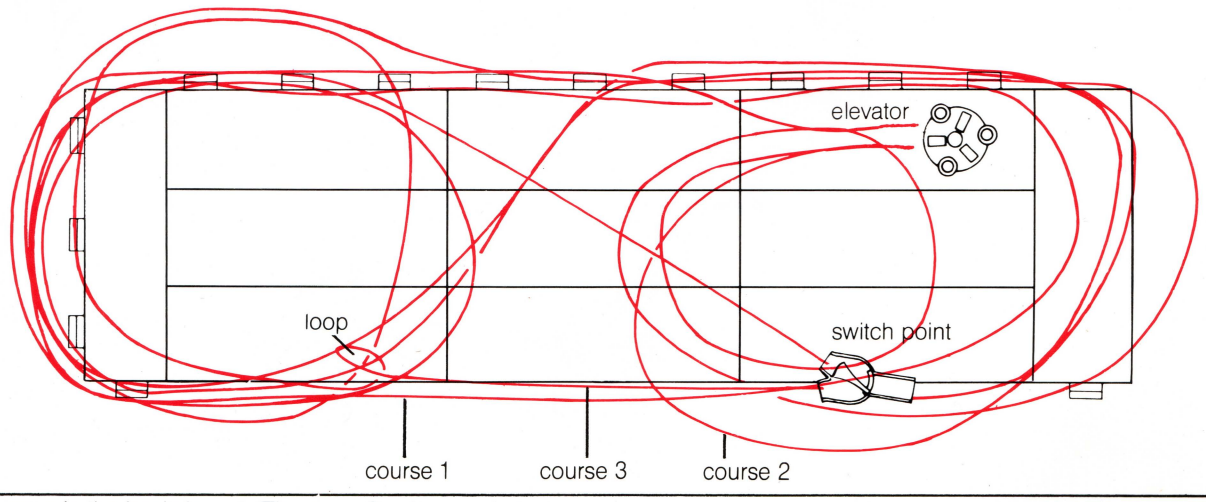


- ● $13\frac{3}{4}$"
- ● $11\frac{3}{4}$"
- ◍ $9\frac{7}{8}$"
- ○ $3\frac{7}{8}$"

• Stand support poles at the places indicated with •. Attach cross bars referring to the package or the picture on page 2. For double loop use $3\frac{7}{8}$" support poles for top and bottom (see page 7). Attach the elevator, the power source, and the motor, as shown.

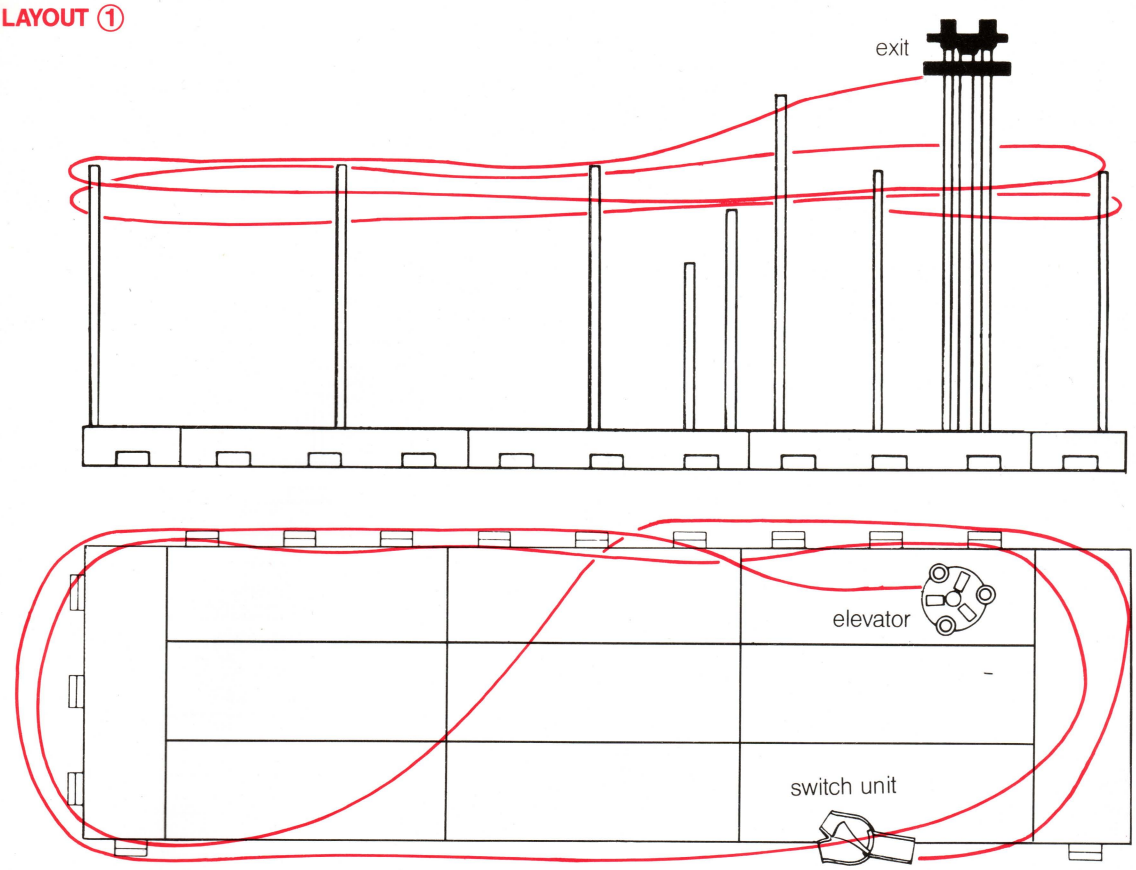
THE WHOLE LAYOUT





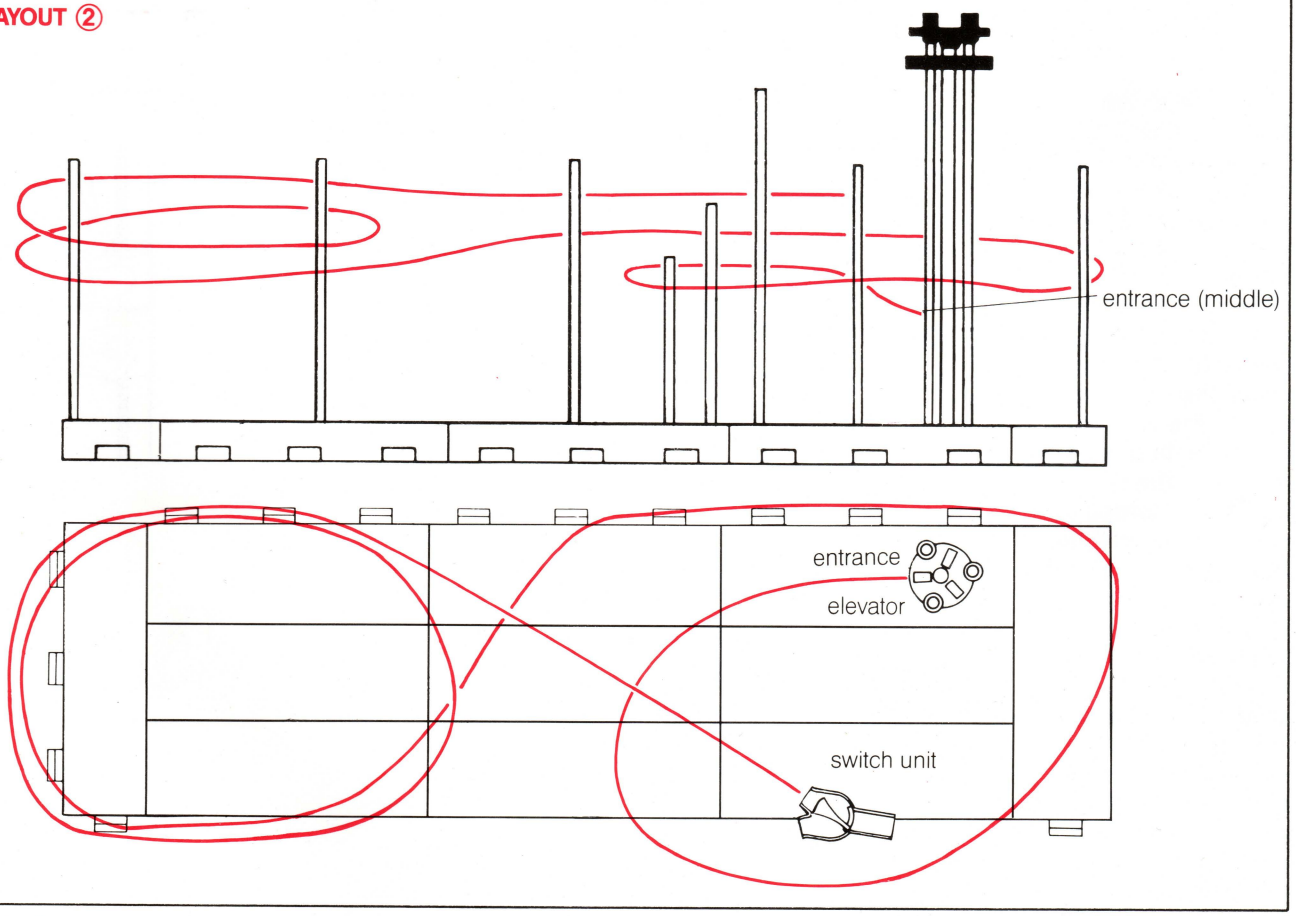
There are 3 courses in the basic layout. (There are 2 entrances but only 1 elevator exit due to the use of the switch.) Assemble, paying careful attention to the picture.

COURSE LAYOUT ①



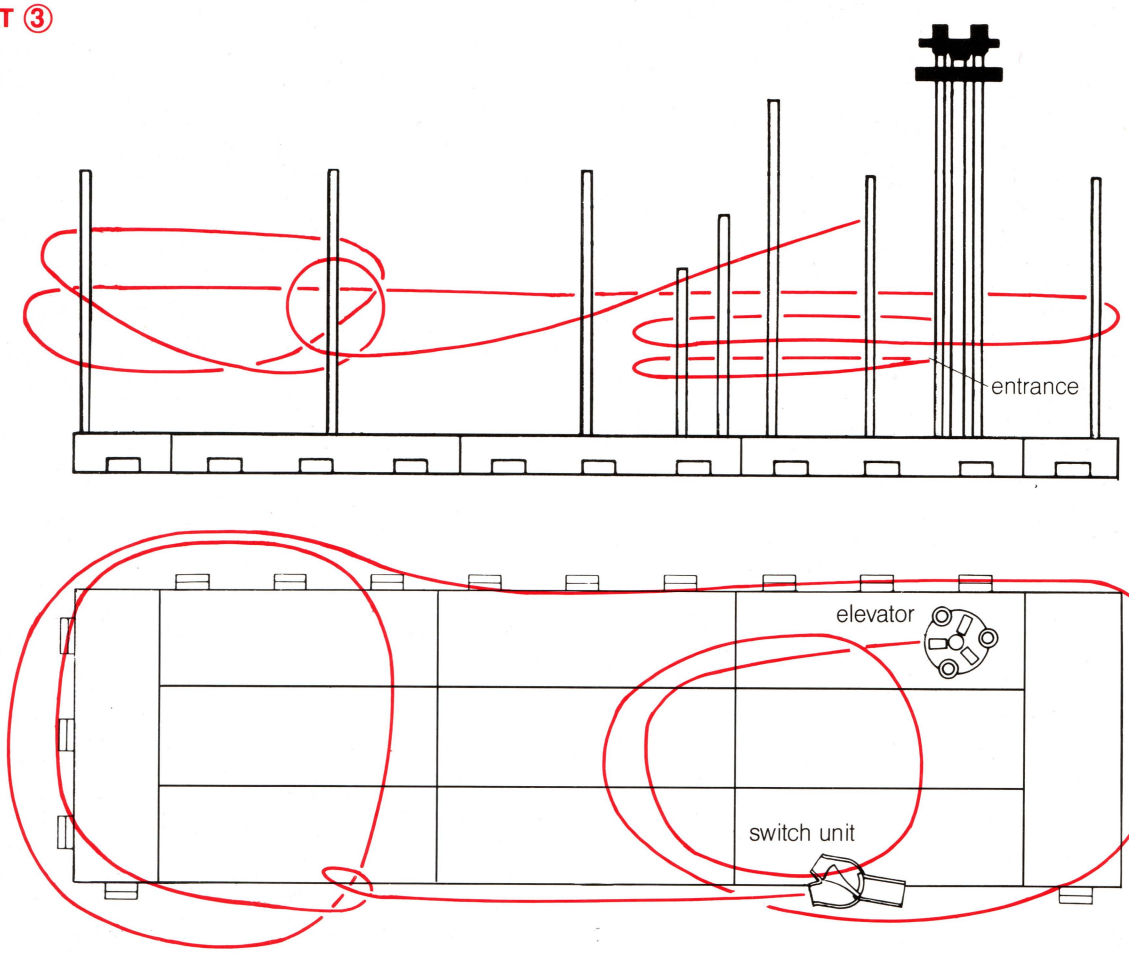
Cut a pair of rails to a length of 145 " and attach them as shown to run from the exit and to the switching point.

COURSE LAYOUT ②



Attach a pair of rails each 130" long to run from the switching point to the entrance.

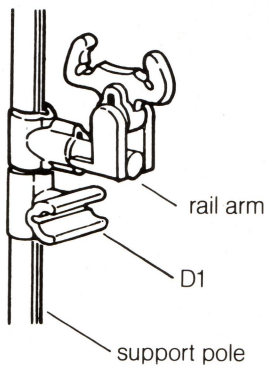
LAYOUT ③



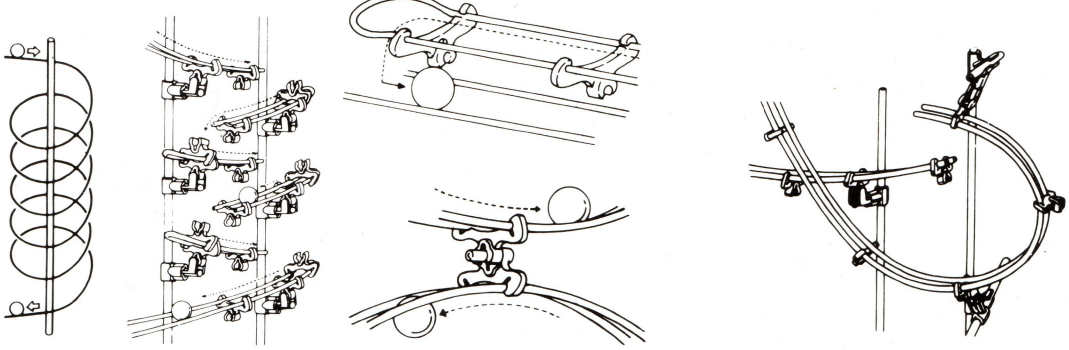
Attach a pair of rails each cut to157" in length to run from the switching point to the elevator entrance.

CHECK POINT 2
When the whole set is assembled, turn the motor on, and try running the balls. Sometimes, balls may run right next to each other. When 2 or 3 balls run right after each other, the rails may sag due to the weight of the balls. In this case, reinforce the rails using rail clamps or support poles. If the rail arms don't exactly match, put D1 or C1 underneath the rail arms. You may also refer to Check Point 1, Instructions for Attaching Rails on Page 6, or Entrance/Exit explanation of the elevators on Page 7, and enjoy smooth and continuous rides.

- After enjoying the basic layouts, feel free to accept the challenge of creating your own original layouts.
- This product allows you to assemble bigger layouts with additional parts. Your ingenuity will enable you to expand the layout to its fullest extent.
- Dust or lint can slow down the movement of balls. Occasional wiping with a silicone cloth is recommended.
- It is dangerous to lean on, or to apply weight to, the completed set.



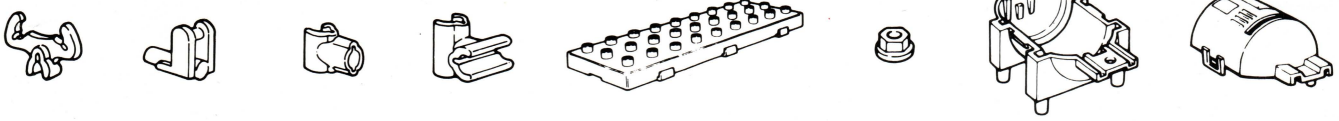
Examples of schemes



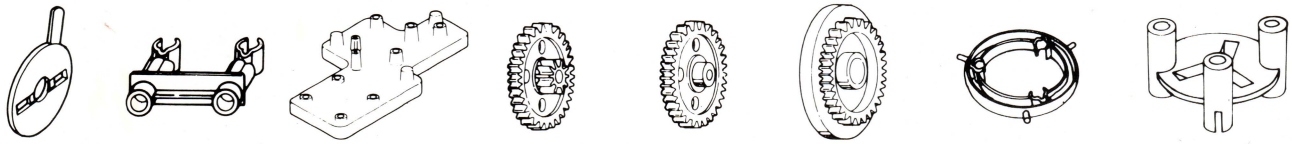
TROUBLE SHOOTING

Problems		Possible reasons
Doesn't move.	The gears don't turn.	The switch is off. The batteries are worn out. The batteries are not placed properly. A wire is loose or improperly wired. Some obstacle is blocking the gears.
	The gears turn.	The gears aren't hooked up closely enough to mesh. The gears are not properly assembled.
It moves sporadically.		The wiring is loose, the battery is weak. The gears are not meshed properly. The gears are not assembled correctly.
The ball falls off the elevator. The ball doesn't climb up the elevator.		The elevator is not perfectly vertical, not aligned properly. The support pole of the elevator is tilted. A wire is loose, the battery is weak.
The ball falls off the course.		See P 6 and 7.
The ball doesn't come out of the elevator.		See P 7.
The ball stops in the middle of the course.		The drop is negative or too little.
It makes a strange noise. It rattles. It makes a rubbing noise.		Loose assembly. The gears are not meshed properly. Something is stuck in the gears.
The ball doesn't make the curve properly.		Adjust the double loop (See P 7). Sometimes it's due to the lack of turning speed. Slide the curve unit up or down on the support pole.
The ball doesn't fit into the curve unit.		Align the Part A1 properly with the hole.

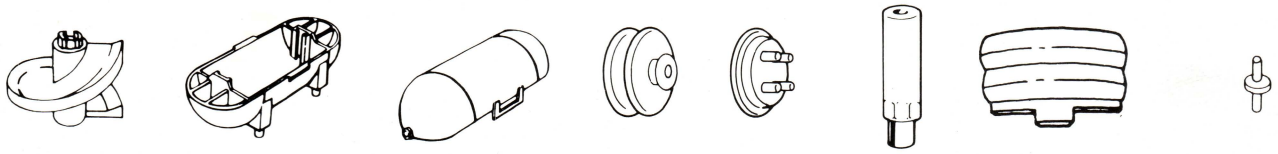
PARTS LIST



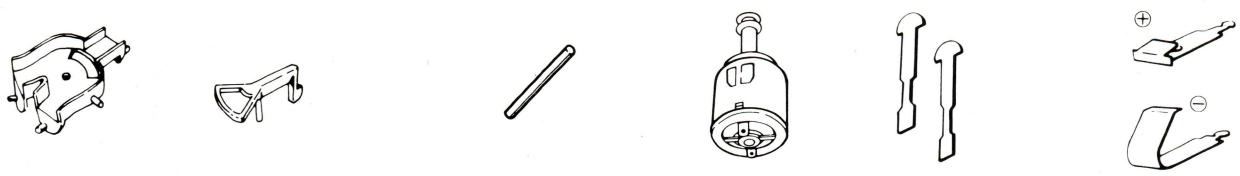
A1	B1	C1	D1	E1	F8	G1	G2
Cross tie	L joint	Joint 1	Joint 2	Base unit	Gear nut	Motor box (bottom)	Motor box (cover)
192 pcs.	64 pcs.	64 pcs.	32 pcs.	11 pcs.	2 pcs.	1 piece	1 piece



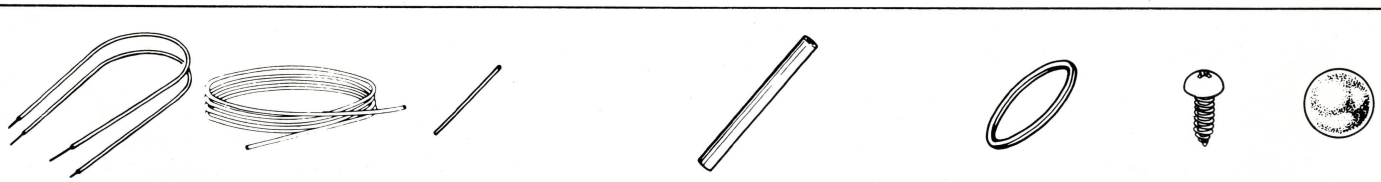
G3	G31	K1	K2	K3	K4	K5	K6
Switch board	Motor bed	Elevator base	Elevator gear	Elevator gear	Elevator gear	Elevator parts	Elevator parts
1 piece	2 pcs.	1 piece	1 piece	1 piece	1 piece	3 pcs.	1 piece



K7	H1	H2	K11	K12	K13	K15	M1
Elevator parts	Battery box (bottom)	Battery box (cover)	Pulley #1	Pulley #2	Pulley mount	Elevator guard	Pipe connecting parts
14 pcs.	1 piece	1 piece	1 piece	1 piece	1 piece	2 pcs.	4 pcs.



P1	P2	Shafts $\frac{3}{32}$" Diam.			Motor	Metal motor fittings	Battery fittings for ⊕ and ⊖
Switch unit	Switch part	$\frac{5}{8}$" long	1" long	$\frac{15}{16}$" long	1 piece	2 pcs.	1 each
1 piece	1 piece	1 piece	1 piece	1 piece			



Lead wire	Rail	Rail joint	Support poles					Rubber belt	Screws for base	Balls
blue, red $7\frac{7}{8}$"	72 feet	$\frac{1}{32}$"Diam., $\frac{3}{8}$" long	$13\frac{3}{4}$"	$11\frac{3}{4}$"	$9\frac{7}{8}$"	$7\frac{7}{8}$"	$3\frac{7}{8}$"	2 pcs.	6 pcs.	5 pcs.
1 each		10 pcs.	5 pcs.	13 pcs.	6 pcs.	6 pcs.	5 pcs.			

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4 Pearl Court
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